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FOLK TAXONOMY AND CULTURAL SIGNIFICANCE OF "ABEIA" (INSECTA, HYMENOPTERA) TO THE PANKARARÉ, NORTHEASTERN BAHIA STATE, BRAZIL

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ABSTRACT.— This paper focuses on the ethnotaxonomy and significance of bees and wasps to the Pankararé Indians living in a semi-arid zone of the Northeast of the State of Bahia, Brazil. The survey was conducted with the Pankararé from Brejo do Burgo village. Data were obtained by using ethnoscientific methods and through open interviews with natives and a native specialist in ethnoapiculture. A total of 23 folk species were recorded within the folk category *"abeia,"* the label used for both Apidae and Vespidae. Considering the ethnotaxonomic aspects, "abeias" are classified in two groups as "fierce bees" and "mild bees". They are also sub-divided into three intermediate taxa depending upon whether or not they sting and, if so, if they can sting repeatedly. Eleven folk species are sources of medicine. Wild honey is the main raw material used in the treatment of illnesses and as food. Honey is also an important source of income for the Pankararé. These insects play significant roles in the social, economical, and cultural life of this group.

RESUMO.— Este artigo focaliza a etnotaxonomia e importância de abelhas e vespas para os índios Pankararé, grupo residente em uma região do semi-árido do Nordeste do Estado da Bahia, Brasil. O estudo foi realizado com os Pankararé da aldeia Brejo do Burgo. Os dados foram obtidos seguindo-se métodos da etnociência, mediante entrevistas abertas com nativos e especialista em etnoapicultura. Um total de 23 etnoespécies foram registradas e "abeia" é o rótulo usado para apídeos e vespídeos. Considerando aspectos etnotaxonômicos, as "abeias" são classificadas em "abeias-brabas" e "abeias-mansas". Elas também são divididas em três famílias folk dependendo da posse do ferrão. Onze etnoespécies são fontes de remédio e o mel silvestre é a principal matéria-prima utilizada no tratamento das enfermidades e como alimento. Mel é também uma importante fonte de insumos para os Pankararé. Observou-se que esses insetos desempenham significativos papéis na vida social, econômica e cultural desse grupo indígena.

RÉSUMÉ. — Cet article porte sur l'ethnotaxinomie et l'importance des abeilles et des guêpes pour les Indiens pankararé qui habitent une région semi-aride du nord-est de l'État de Bahia au Brésil. L'étude a été réalisée dans le village pankararé

de Brejo do Burgo. Les données ont été obtenues au moyen de méthodes ethnoscientifiques et d'entrevues semi-dirigées menées auprès des autochtones et d'un spécialiste autochtone en ethnoapiculture. L'enquête a révélé vingt-trois espèces d'"*abeia*", la catégorie vernaculaire utilisée pour désigner à la fois les apidés et les vespidés. Cette catégorie comporte deux groupes nommés respectivement "*abeia-braba*" et "*abeia-mansa*". Le taxon "*abeia*" est également subdivisé en trois taxons de niveau intermédiaire définis en fonction des espèces qui piquent ou non et, le cas échéant, si elles le font de façon répétée. Onze espèces vernaculaires servent à préparer des médicaments. Le miel sauvage est la principale matière première utilisée dans le traitement des maladies et comme aliment. Le miel constitue également une source de revenus importante pour les Pankararé. Les abeilles et les guêpes jouent un rôle significatif dans la vie sociale, économique et culturelle de ce groupe amérindien.

INTRODUCTION

Amerindian peoples possess an ethnobiological knowledge accumulated over hundreds of years of interaction with nature. This is shown by the diversity of relationships that Indians maintain with animals and plants in the localities where they live. Insects have played important roles in the social, economic, and cultural systems of many traditional, non-industrial peoples (Gudger 1925; Weiss 1947; Coimbra 1985; Posey 1979, 1986, 1987; Ramos-Elorduy 1987; Ribeiro and Kenhíri 1987; Dufour 1987; Ratcliffe 1988; Ramos-Elorduy and Pino 1988; Starr and Wille 1988; Camargo and Posey 1990; Setz 1991; Hunn 1997). Social insects, in particular, have had outstanding significance due to their social nature and behavioral patterns (Posey 1986). The study on the perception, knowledge, and uses of insects by human societies is the subject matter of ethnoentomology, a branch of ethnozoology (Posey 1987).

The Brazilian Northeast is characterized by a widespread semi-arid climate with a deciduous, woody vegetation dominated by thorny cacti and bromeliad species that comprise what is traditionally called *caatinga* ('white forest' in the Tupi language). In this geographical area human populations have adapted to very severe drought periods ranging from five-nine months annually. Today, there are 23 Brazilian indigenous groups living in the semi-arid zone or in transitional areas (ANAI 1981). Most are subject to powerful acculturative pressure from white society (Ribeiro 1987). Despite this cultural richness, the vast majority of ethnobiological surveys have been traditionally conducted with indigenous tribes and *caboclos* ('peasants') in the Amazon basin and surroundings. Studies of northeast Brazilian indigenous ethnobiology are generally limited to ethnobotany (Bandeira 1972; Mota 1987). The only available reference on ethnozoology is a brief survey of the Pankararé (Bandeira 1993).

In this semi-arid environment, bee species, in particular, stand out from the rest of the entomofauna because of their ecological performance as important pollinate agents of the ***caatinga*** flowers (Machado 1990). They also supply honey and other products that are sources of food, medicine and income for local inhabitants, who are obligated to adapt to great periods of drought. Althought studies have been carried out on bees in this ecosystem, especially *Apis mellifera* (Castro 1994;

Martins 1990; Aguiar 1995; Martins and Aguilar 1992; Ducke 1907), there are no surveys about bee ethnobiology and ethnotaxonomy.

Posey (1987) argues that traditional knowledge about ecology and biological diversity can generate new ideas to the complement Western scientific knowledge of these phenomena. In that spirit, I record here the ethnotaxonomic aspects of social insects of the order Hymenoptera (excluding ants) and their importance to the Pankararé Indians from the northeastern region of Brazil.

THE COMMUNITY

Studies on the Pankararé began in the 1970s and they resulted in the recognition of this group as an indigenous community. According to Pinto (1991), the Pankararé seem to be descendants of the Gê Indians. However, the Pankararé are now highly acculturated through mixing with peoples of different cultural and linguistic groups.

The Pankararé are an undifferentiated linguistic unit restricted to the northeastern portion of the State of Bahia, Brazil. Most of the Pankararé (900 individuals) live at Brejo do Burgo village which is situated at the edges of the Raso da Catarina Ecological Station (Figure 1). This is the driest region of Bahia State with a mean annual temperatura of about 27° C and rainfall about 400 mm per year (CEI 1994).

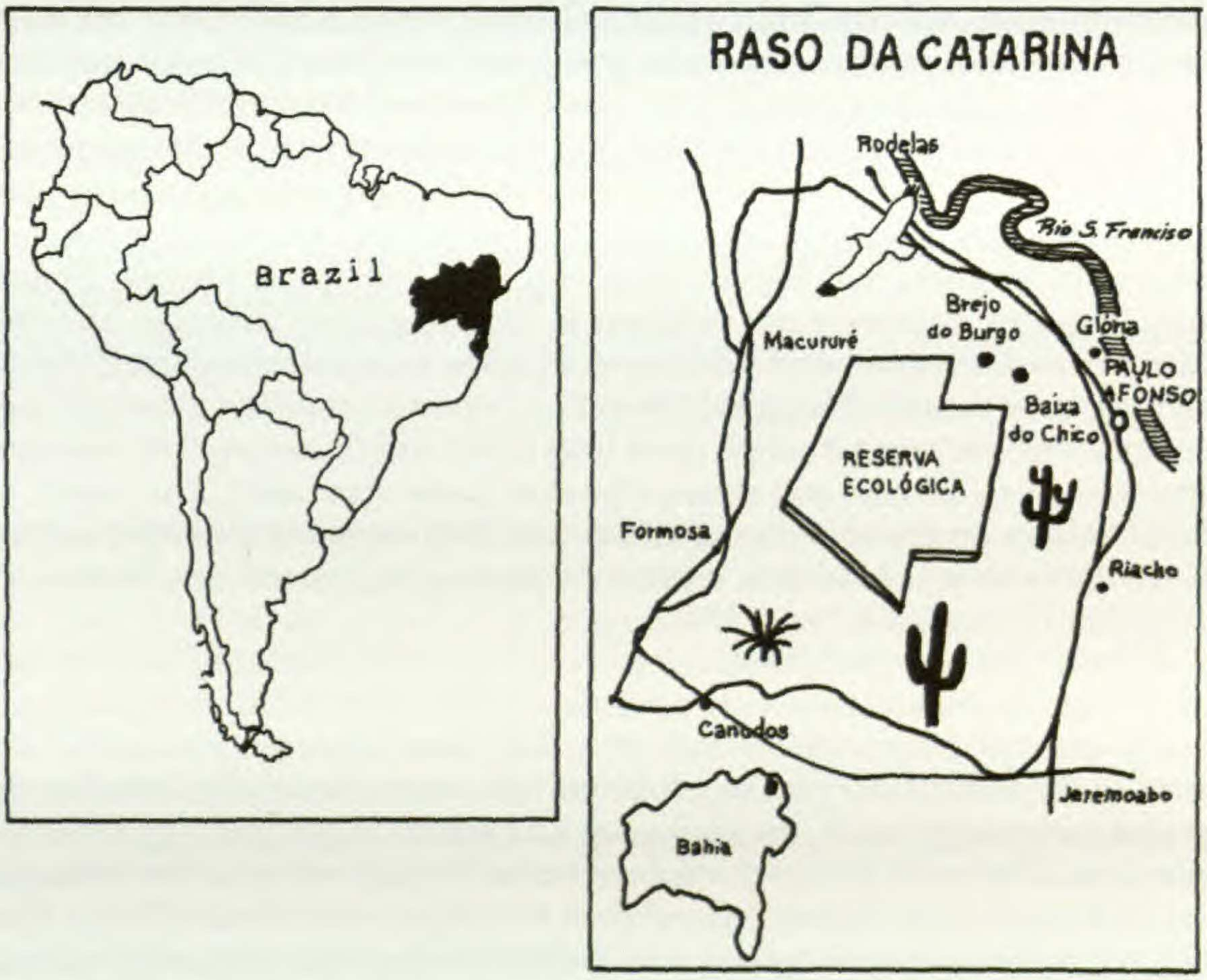

FIGURE 1.—Map showing location of the Brejo do Burgo village where the study was undertaken.

Information on geology is found in Almeida and Figueiroa (1984). Their territory is a predominantly ***caatinga*** area.

People are distributed in small familial agricultural groups around Brejo do Burgo village. The main crops are maize, bean, and manioc, cultivated both for home consumption and for market exchange. This activity is conducted in the rainy months (April to August) due to more propitious conditions of the soil and water availability. The main protein sources are goat, pig, and chicken meat. However, they complement their dietary needs with game, honey, and wild fruits (***imbú*** [*Spondias tuberosa*, Anacardiaceae]; ***murici*** [*Byrsonima gardneriana*, Malpighiaceae]; ***licuri*** [*Syagrus coronata*, Arecaceae]; and ***castanha-de-caju*** [*Anacardium occidentale*, Anacardiaceae]) (Maia 1992). Young people have been migrating to the larger cities for remunerative employment. Data concerning educational and political issues were not collected for this study.

METHODS

The observations reported here are based on fieldwork performed during monthly visits of about three days each from July to November 1995 with Indians of the Brejo do Burgo village. Fourteen individuals (nine men and five women) 18-67 years old were interviewed. Males proved to be more knowledgeable about folk names and behavioral traits of each specimen than the females. This is presumably because the men hunt game and collect wild honey. Only one native specialist in ethnoapiculture has been questioned, who was the major consultant (Afonso Pankararé, 42 years old). Interviews were conducted in Portuguese since the Pankararé are bilingual in this language. Consultants were all literate to some degree; they made their living by farming livestock (goats and pigs), and by planting corn, manioc, beans, watermelon, and cantaloup, which are marketable products. In addition, they harvest honey for their own use or for sale. Unfortunately, linguistic data were not collected in the indigenous language. However, most terms are Portuguese and, with few exceptions, are used by both the Pankararé and other rural peoples throughout Brazil.

Data were obtained through open interviews and by noting folk taxonomic features and uses of bees and wasps reported by the Pankararé. The "emic" approach focuses on the native people; the way they organize, perceive, use, and manage their natural resources, without imposing the researcher's Western categories (Sturtevant 1964; Posey 1986).

Insects were collected at their nests or as they were visiting flowers by using entomological nets, and then were preserved in 70% alcohol. The indigenous consultants identified them before and after they were captured. Specimens were shown to the Indians in order to ask about folk names, basic uses, whether they were kept for honey or not, their behavior and presence in mythology, folklore or ceremonial. They were later mounted on pins at the Laboratory of Entomology of Feira de Santana State University, and then sent to experts to be identified. Specimens other than eusocial Apidae and Polistinae Vespidae were also collected. Altogether, thirty specimens were collected.

Wasps species were identified by Dr. Oton Marques, of the Agricultural School of Bahia Federal University; bee species were identified by Dr. Marina Siqueira,

Department of Biology of Feira de Santana State University. Though specimens of ***manduri, mané-de-abreu, mandassaia,*** and ***exuí*** were not found during fieldwork, their scientific names are tentatively given here based on the Brazilian insect folk names catalogued (Lenko and Papavero 1979; Buzzi 1994). Vouchers were deposited at the laboratory cited above.

RESULTS AND DISCUSSION

The present study on the Pankararé ethnoapiculture has revealed important aspects of their traditional entomological knowledge. At least 23 categories of insects are classified as ***abeias*** ("bees") by the Pankararé Indians, who put together under this label those hymenopterans that produce and store honey (eusocial, melliferous bees and wasps). The word "bee" appears here in quotes in order to contrast it with "bee," as normally used, since this latter term properly designates only the superfamily Apoidea, excluding wasps. All "bees" are believed to be enchanted living organisms and are protected from human exploitation by guardian spirits of plants and animals called ***encantados***. As Bandeira (1993) notes, the Pankararé have a very accurate ethnotaxonomy of "bees." The precision of their description addresses morphological and adaptative details. For example, the local specialist says that these insects carry pollen (***saburá***) on their legs. It is known that Apidae evolved the curbicula or pollen basket, a derived structural modification of the hind tibia which is used to transport pollen, wax, resin, and other substances. The Pankararé also know from which plants "bees" have taken pollen by observing the color and taste of honeys. As the informants say:

> "... here is the ***saburá*** (pollen). It is from this little yellow mass that honey is made. It comes from the juice of the flower ... Bee does not make honey with other thing. All bees make honey from the juice [that is, the pollen] of the flower. Larvae food is ***saburá***".

All human groups answer to the biological diversity in their environments by grouping plants and animals taxonomically in labeled subordinate or superordinate categories (Brown and Chase 1981). Following Berlin's principles of categorization (Berlin 1992), the term ***abeia*** or "bee" is at the life-form rank. In contrast to what has been noted in most other ethnobiological classification systems, the most inclusive taxon – the kingdom rank – is named and labeled ***animali*** ('animal'), thus "bees" and the rest of the faunal categories fit beneath this label. The life form taxon *abeia* is, in turn, divided into two intermediate categories. If a "bee" shows an aggressive defensive behavior it is labeled a "fierce bee" (***abeia braba*** in Portuguese). This category includes the honeybee *Apis mellifera*, seven species of social vespids of the Epiponini tribe (carton nest species), and one species of the Meliponinae locally named ***arapuá*** (*Trigona spinipes*). If not aggressive, they are referred to as "mild bee" species (***abeia mansa***). These are all meliponines (stingless bees). This distinction implies the manner by which the Indians deal with wasps and bees. They burn green wood near a nest or hive of the fierce species to keep away or to kill the adults. Then they harvest the honey, wax, and larvae.

It is worth noting that these insects are classified in three intermediate taxa

TABLE 1.— Pankararé taxonomic classification of wasps and bees (Insecta: Hymenoptera) placed in the "bee" life form, showing intermediate categories of folk families according to their aggressive behavior.

Intermediates	Folk genera and species (scientific species)	fierce	mild
Exu's line (Vespidae, Polistinae, Epiponini)			
	cangota (*Polybia occidentalis*)	X	
	caraquile (*Polybia paulista*)	X	
	exu-de-cachorro (*Protopolybia exigua exigua*)	X	
	exu-preto (*Polybia ignobilis*)	X	
	exu-verdadeiro (*Brachygastra lecheguana*)	X	
	exuí (*Polybia* sp.)	X	
	tarantantã (*Polybia sericea*)	X	
Oropa's line (Apidae, Apinae)			
	oropa (*Apis mellifera scutellata*)	X	
Arapuá's line (Apidae, Meliponinae)			
	abeia-branca-do-fundinho-branco (*Frieseomellita silvestrii*)		X
	abeia-branca-do-fundinho-vermeio (*Frieseomellita silvestrii*)		X
	arapuá-macho (*Trigona spinipes*)	X	
	arapuá-fêmea (*Trigona spinipes*)	X	
	cupira-boca-de-barro (*Partamona cupira*)		X
	cupira-boca-de-berruga (*Partamona cupira*)		X
	mandassaia (*Melipona quadrifasciata* ?)		X
	manduri (*Melipona rufiventris* ?)		X
	mané-de-abreu (*Frieseomelitta varia* ?)		X
	mosquito-preto (*Plebeia mosquito*)		X
	mosquito-remela (*Friesella schrottkyi*)		X
	mosquito-verdadeiro (*Tetragona angustula*)		X
	papa-terra (*Cephalotrigona capitata* ?)		X
	trombeta (*Plebeia* sp.)		X
	uruçu (*Melipona scutellaris*)		X

depending upon the presence or absence and the loss or retention of the sting (Table 1). The Pankararé put all Epiponini wasps in the "line" or folk family (intermediate taxon) of those "bees" that retain their stinger. They state that some kinds of fierce "bees" can use their stings more than twenty times. This folk family is usually designated as "***exu***'s line", where ***exu*** is a polysemic taxon that occupies both this intermediate position and the generic rank. The honeybee (*Apis mellifera scutellata)* by itself comprises "***oropa***'s line" because it loses its stinger after one use. As one informant (Afonso Panakararé) stated:

> "***Exu-verdadeiro, cangota, tarantantã, caraquile, exu-preto***, and ***exuí*** have all the same bite, the same sting, and the same line. They can bite you more than one time.... The sting of an ***oropa*** is different, more simple. If one bites you it leaves its sting on you and it cannot bite you any more because an other sting is not born."

The third folk intermediate grouping is formed by 15 folk species of stingless "bee," it is referred to as "***arapuá***'s line". The first two lines include the "fierce

bees"; the last is equivalent to the mild ones. Though ***arapuá*** is identified as aggressive it lacks a sting.

Drones and workers are not distinguished but a "master bee" (***abeia mestra***) is. Consultants recognize that all "bees" have a master living inside the nest; it is distinguished from the others by its larger size. This is presumably the queen.

The material and cultural significance of "bee" resources along with the stinging behavior of some types may explain the fine recognition of categories within these folk families. The indigenous classification of social hymenopterans in lines shows an impressive one-to-one correspondence to the scientific families of Western taxonomy (see Table 1). The taxa included are distinguished by morphological and behavioral criteria, such as shape and size, color pattern, nesting behavior, hive structure, arrangement of honey in combs, honey production, fierceness, etc.

In contrast, the social vespids with open nests, the "true" wasps (*Polistes* and *Apoica* spp.), are set apart as ***maribondo***. Since these wasps do not produce honey the Pankararé do not harvest them for food, but instead use their nests as medicine to treat dizziness, asthma, and stroke. As the Pankararé say, "***maribondo-chapéu*** (*Apoica pallens*) and ***maribondo-caboclo*** (*Polistes canadensis canadensis*) are not 'bees' because they do not produce honey." Hymenopteran specimens other than the Apidae and Polistinae (Vespidae), such as potter wasps, carpenter bees, ground-nesting, solitary bees, and wasps were all classified as "beetles," and some specimens lack folk names. The ethnotaxonomy of these insects has not been completely analyzed and will not be discussed here.

Pankararé nomenclature and Berlin's general principles.— The construction of specific names in folk systematics is regularly binominal with the folk generic name modified by an adjective which often designates some obvious morphological character. Monominal specific names are also found in folk taxonomies, but when they occur they are polysemous with respect to the superordinate generic. The distinction between a prototypical, polysemously named folk specific taxon and its superordinate generic may be made explicit by the use of a marking attributive that may be rendered as 'real', 'original', 'best looking', or 'true' (Berlin 1992:90-96). Two examples of prototypical folk specific taxa have appeared in the Pankararé ethnotaxonomy. ***Exu-verdadeiro*** ('true exu' *Brachygastra lecheguana*) is a short-bodied and dark-colored social wasp, with yellow transverse bands on the tip of the abdomen. This folk species is probably the prototype due to its powerful sting and the quantity of honey which it stores. Two others folk species included in the ***exu*** folk genus are ***exu-de-cachorro*** ('dog's exu' *Protopolybia exigua exigua*) and ***exu-preto*** ('black exu' *Polybia ignobilis*). Their nests are made of cow dung and are considered to be medicinal (Table 2). The other prototypical folk specific is described as ***mosquito-verdadeiro*** ('true mosquito', *Tetragona angustula*) and, according to Atenor Pankararé (55 years old), this typical form is said to produce more honey than its neighbors, ***mosquito-remela*** ('gummy mosquito', *Friesella schrottkyi*) and ***mosquito-preto*** ('black mosquito', *Plebeia mosquito*). Some informants stated that ***mosquito-verdadeiro*** makes about one liter of honey whereas ***mosquito-preto*** only produces half that. These tiny stingless bees are attracted to human perspiration and they usually nest in small hollow logs. Their honey is taken as medicine.

Naming by binary contrast is a common linguistic feature where a primary

lexeme is modified to form two secondary lexemes according to an obvious semantic dimension. Three sets of specific taxa are formed by this process in the Pankararé entomological classification system. The folk specific taxa included in folk generic ***abeia-branca*** are clearly marked by binary contrast in which the color pattern of the abdomen is the main semantic dimension. While ***abeia-branca-do-fundinho-branco*** ('white-tailed white bee') has its abdomen colored white, the contrasting specific taxon, namely ***abeia-branca-do-fundinho-vermelho*** ('red-tailed white bee'), has its abdomen marked red. The hive entrance of both types is said to be made of wax.[1] Taxonomically, the two kinds of ***abeia-branca*** are likely to represent varieties of a single scientific species, *Frieseomellita silvestrii*.

The same can be said for ***cupira*** (*Partamona cupira*), though no specimens were examined by the specialist. The distinction between ***cupira-boca-de-berruga*** ('wart-mouth cupira') and ***cupira-boca-de-barro*** ('clay-mouth cupira') alludes to the material which is used to build their hive entrance. The former folk species opens a little hole in the tree in which it lives, which is lined with wax, whereas the latter goes inside a termite nest and uses clay to construct its hive entrance. The third generic taxon illustrating binary contrast at the folk specific rank is ***arapuá***. The distinctive semantic dimension used to separate the two types of ***arapuá*** is the quantity of honey produced by each, in combination with the size of the hive entrance. ***Arapuá-macho*** ('male arapuá') is thought to produce more honey than ***arapuá-fêmea*** ('female arapuá'), and its hive entrance is the longer of the two. Nests of both folk species are made of cow dung and vegetable matter. Their honey is considered to be tasteful. These two folk species correspond to only one scientific species, *Trigona spinipes*. Apparently, the ***arapuá-macho*** hive is older and so its entrance is longer than that of ***arapuá-fêmea***. Consultants say that ***cupira*** resembles ***arapuá*** but it is slightly longer and brighter than the latter. Thus, the 23 categories of "bees" recognized by the Pankararé include monotypic folk genera, polysemous generics, as well as binomially and monomially named folk specifics.

The cultural significance of "bees" for the Pankararé.— The knowledge of an elaborate ethnotaxonomy of social insects indicates the high cultural significance of eusocial bees and wasps for the Pankararé. The Indians interact with these animals in many different ways, using them as food and medicine, consuming wild honey in religious festivities, and utilizing beeswax to make tools, such as bullets, or to stopper pots. Not only is their honey eaten, but also their larvae and pupae. The Pankararé roast *Apis mellifera scutellata* and *Polybia sericea* larvae in their combs, then extract them with small sticks to be eaten alone or mixed with manioc flour. The Pankararé go primarily to the ***caatinga*** to search for those "bees" whose honey is of higher quality, such as ***oropa*** and some stingless bees. Informants assert the quality of honey depends on the quality of the tree in which the hive was made, the age of the hive, and the flowering season. Honey-producing wasps, by contrast, produce little honey which is of low quality, but their larvae are very nutritious. When harvesting their honey they can eat larvae and pupae locally or take them home for their children and wives. Although used as a food source, "fierce bees" are not kept by the Pankararé as is done in other communities (e.g., Hunn 1977). It is interesting to note that these resources are readily available to men because they harvest wild hives. In addition to larvae consumption, the pollen sacks (***fio azedo***) of ***abeia-branca*** are used medicinally against influenza.

Pankararé sell honey in the market in Paulo Afonso, generating cash to buy foodstuffs such as sugar, flour, and salt. This activity is conducted in the driest months of the year when low agricultural production coincides with a higher honey productivity. Honey is also important when hunting in the ***caatinga*** woods, where "water and food are available only for those who know how to achieve these resources" (Bandeira 1993). The importance of insects as food is indicated by the number of calories which is obtained by the ingestion of bee larvae (here concerning Apidae only). This is greater than that of their honey, which is considered a high energy food. Honey produces 4.053 kcal/kg against 4.756 kcal/kg for the pupae (Ramos-Elorduy and Pino 1990).

Bees and their products have been noted as important for their healing powers by ancient and modern medical sciences and in many different human societies

TABLE 2.— "Bees" used as medicine by the Pankararé Indians from Northeastern Brazil, related to raw materials, usage, and indications. Also included true wasp medicine.

Pankararé name	Scientific name	Raw materials	Usage	Indications
abeia-branca	*Freiseomellita silvestrii*	"fio azedo" (pollen pot)	eaten	influenza
arapuá	*Trigona spinipes*	honey	eaten	diabetes
cupira	*Partamona cupira*	honey	eaten	throat inflammation
exu-de-cachorro	*Protopolybia exigua exigua*	nest	inhaled	evil eye
mandassaia	*Melipona quadrifasciata ?*	honey	eaten	snake bites
maribondo-chapéu	*Apoica pallens*	nest	inhaled	dizziness, asthma, stroke
mosquito-preto	*Plebeia mosquito*	honey	eaten	throatache
			massaged	"sapinho" (oral micoses)
oropa	*Apis mellifera scutellata*	honey	eaten	diabetes, bronchites, tuberculosis, hoarseness, verminousis
		wax	inhaled	headache, dizziness
papa-terra	*Cephalotrigona capitata ?*	honey	eaten	snake bites
tarantantã	*Polybia sericea*	nest	inhaled	"mal do tempo" (stroke ?)
trombeta		wax	inhaled	"mal do tempo"
		wax	eaten	diabetes
uruçu	*Melipona scutellaris*	honey	eaten	snake bites, rabid dog bites, impotence

(Ioirich 1986; Weiss 1947). In Pankararé medicinal usage, 11 "bees" provide 13 raw materials used to prepare remedies to treat or prevent 16 illnesses (Table 2). Honey is the main resource recommended in cases of diabetes, bronchitis, oral micoses, sore throat, intestinal worms, and impotence. It is considered also an powerful antidote against bites of snakes and rabid dogs bites. The multiple uses of stingless bee honey as medicine is justified by its chemical diversity (Pamplona 1992). The bactericidal properties of bee products, whether pollen or bee glandular secretions added when honey is dehydrated (Cortopassi-Laurino and Gally 1993), are well known. In Pankararé ethnoentomology, two species of social wasps of the Polistinae have been used as medicines. A bath of the smoke from burning nests of ***tarantatã*** (*Polybia sericea*) and ***exu-de-cachorro*** (*Protopolybia exigua exigua)* are thought to be useful in treating evil eye and strokes. At least one resource is traditionally used in ethnoveterinary medicine. A piece of an ***arapuá*** nest is dissoved in water, which is then used to bathe dogs with fleas or scabies. Indeed, insect products are reputed to have immunological, analgesic, diuretic, anesthetic, antirheumatic, and even aphrodisiac properties. Understanding the traditional modes of use of medicinal insects and studying their active principles in laboratories may suggest prototypes for new drugs, such as the established commercial products Melitin, Oftalmosept, Apinen, Apicosan, and Apimoset (Ramos-Elorduy and Pino 1988). Wasps have also played important roles in folk beliefs (Starr and Wille 1988; Posey 1987; Lenko and Papavero 1979).

Conservation of the apifauna of the Brazilian caatinga. — The ***caatinga*** environment is characterized by prolonged seasonal drought. However, it supports a singular biodiversity in fauna and flora, exuberant in times of rain. Nevertheless, this Brazilian ecosystem has been seriously deforested during centuries of unrestrained exploitation for wood extraction and cattle pasture. This has decreased the vegetal covering and consequently the number of "bee" species. Although the ***encantados*** are feared because they severely punish those who misuse game uselessly, this taboo has weakened among young Indians just because their beliefs have been left behind. Many of them have become acculturated when studying in towns, and a significant fraction of the Pankararé population, as well as those of other northeast Brazilian peoples, have migrated south to the rapidly growing cities in search of better living conditions. This is a serious problem, considering the overexploitation of native resources, mainly by ***posseiros*** ('white, non-indigenous settlers'). Traditional folk knowledge of biological diversity and ecological relationships of the semi-arid zone diminish as the indigenous population declines.

Honeybees and stingless bees are in danger of extinction in some areas of the world. Harvesting their hives has resulted in the elimination of many colonies (Roubik 1989). Consultants report that the number of stingless bee colonies is declining and that these insects are becoming rare. In addition, the Pankararé believe that *Apis mellifera* has influenced the reduction of some Meliponinae. They say that this introduced species arrived at Raso da Catarina Ecological Station about 30 years ago, and that it has since displaced the less aggressive indigenous species, appropriating their sources of nourishment. Despite its good taste, abundant honey, and economic value, *Apis mellifera* is not kept by the Pankararé. One alternative for stingless bee conservation is to encourage beekeeping by native people

in a way that respects the local indigenous cultures. Thus, indigenous bee species would be preserved and the lives of the local people improved. As observed in Brejo do Burgo village, there is some husbandry of bees of the native species *Melipona scutellaris,* which is reared near houses in natural tree cavities or hollow logs or in artificial hives (***cortiços***), which are installed under the eaves of the house or tied on the branches of a tree. This activity is not common and needs to be better understood as a potential conservation strategy.

CONCLUSIONS

I report here results of the first ethnoentomological study of the folk taxonomy and cultural importance of social insects among the Pankararé. These insects are significant as medicines and in the economy of this tribe. Nests and honey are utilized as food and medicine, beeswax is used to stopper pots or to make bullets. Their ethnotaxonomy shows that honey-producing bees and wasps are classed together in the life form ***abeia*** or "bee," which is divided into three intermediate taxa according to whether they sting or not and, if so, if they can sting repeatedly. Prototypical folk species and binary contrast sets are named, but further study is necessary to clarify the folk taxonomic treatment of hymenoptera other than the Apidae and Vespidae.

Due to processes of acculturation that have affected the younger generation and pressures on the ***caatinga*** environment, the entomological resources of the Pankararé have been overexploited. Native stingless bee colonies may survive if conservation programs that encourage beekeeping are developed in accord with both folk and scientific techniques. This survey was concerned not only to record the ethnoentomology of social insects in this one traditional society of northeastern Brazil, but also to call attention to threats to the habitat of these people and thus to the cultural diversity of this region.

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NOTES

[1] As the specialist consultant could not be found at the moment of collecting specimens of ***abeia-branca***, those collections were shown to other consultants. However, they were unable to distinguish to which folk variety they belonged. So, the specimens were assigned only the folk generic name.

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